IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

Claim 1 (canceled).

2.   (new): A digital watermark information extracting method in which digital watermark information is extracted from image data which has the digital watermark information embedded therein by altering at least one pixel data located at a predetermined position on a specific coordinate and is geometrically deformed, comprising:

an embedding position check step of performing the processing of extracting at least one pixel data at a predetermined position on the specific coordinate from the Image data, obtaining difference between a data value of the pixel data thus extracted and a reference value, and outputting a bit value of the pixel data thus extracted which is judged from the difference and reliability of the bit value thus judged to judge whether the information is embedded in the pixel data while applying the geometrical deformation on the image data until it is confirmed that the reliability is higher than a predetermined value.

3.   (new): A digital watermark information extracting method as claimed in claim 2, wherein said embedding position check step comprises:

a roughly check step of executing the processing of extracting from the image data at least one first pixel data located at a predetermined position on the specific coordinate;

obtaining first difference between a data value of the first pixel data thus extracted and a reference value; and

outputting a bit value of the first pixel data thus extracted which is judged from the first difference and first reliability of the bit value thus judged to judge whether the information is embedded in the first pixel data concerned while applying the geometrical deformation on the image data by every first geometrical deformation rate until it is confirmed that the first reliability is higher than a predetermined value; and

a detailed check step of executing the processing of extracting from the image data at least one second pixel data located at a predetermined position on the specific coordinate, obtaining second difference between a data value of the second pixel data thus extracted and a reference value, and outputting a bit value of the second pixel data thus extracted which is judged from the second difference and second reliability of the bit value thus judged to judge whether the information is embedded in the second pixel data concerned while applying the geometrical deformation on the image data by every second geometrical deformation rate smaller than the first geometrical deformation rate within a predetermined range containing the geometrical deformation rate when it is confirmed in said roughly check step that the information is embedded in the first pixel data, until it is confirmed that the second reliability is higher than a predetermined value.

4. (new): A digital watermark information extracting method as claimed in claim 2, wherein in the case that each of bit data items constituting the digital watermark information is embedded in the image data by applying an alteration on at least one pixel data located at a predetermined position on a specific coordinate, said embedding position check step is executed for at least one bit data item among the bit data items, and extraction of the bit data items is performed on the image data on which geometrical deformation is applied, the geometrical deformation being employed when pixel data in which at least one bit data item is embedded is confirmed.

5. (new): A digital watermark information extracting method as claimed in claim 2, wherein said reference value is a data value of pixel data located near the pixel data thus extracted, or a data value of the pixel data thus extracted which is estimated by an interpolation using at least two pixel data items located near the pixel data thus extracted.

6. (new): A digital watermark information extracting method in which digital watermark information is extracted from image data which has the digital watermark information embedded therein by altering at least one pixel data located at a predetermined position on a specific coordinate and is geometrically deformed, comprising:

an embedding position check step of performing the processing of extracting at least one pixel data at a predetermined position on the specific coordinate from

the image data, obtaining difference between a data value of the pixel data thus extracted and a reference value, and outputting a bit value of the pixel data thus extracted which is judged from the difference and reliability of the bit value thus judged to judge whether the in-formation is embedded in the pixel data while altering the predetermined position on the image data by applying an deformation on the specific coordinate until it is confirmed that the reliability is higher than a predetermined value.

7.   (new): A digital watermark information extracting method as claimed in claim 6, wherein said embedding position check step comprising:

a roughly check step of executing the processing of extracting from the image data at least one first pixel data located at a predetermined position on the specific coordinate, obtaining first difference between a data value of the first pixel data thus extracted and a reference value, and outputting a bit value of the first pixel data thus. extracted which is judged from the first difference and first reliability of the bit value thus judged to judge whether the information is embedded in the first pixel data concerned while altering the predetermined position on the image data by applying an deformation on the specific coordinate by every first deformation rate until it is confirmed that the first reliability is higher than a predetermined value; and

a detailed check step of executing the processing of extracting from the image data at least one second pixel data located at a predetermined position on the specific coordinate, obtaining second difference between a data value of the second pixel data thus extracted and a reference value, and outputting a bit value of the

second pixel data thus extracted which is judged from the second difference and second reliability of the hit value thus judged to judge whether the information is embedded in the second pixel data concerned while altering the predetermined position on the image data by applying an deformation on the specific coordinate by every second deformation rate smaller than the first deformation rate within a predetermined range containing the deformation rate when it is confirmed in said roughly check step that the information is embedded in the first pixel data, until it is confirmed that the second reliability is higher than a predetermined value.

8. (new): A digital watermark information extracting method as claimed in claim 6, wherein in the case that each of bit data items constituting the digital watermark information is embedded in the image data by applying an alteration on at least one pixel data located at a predetermined position on a specific coordinate, said embedding position check step is executed for at least one bit data item among the bit data items, and extraction of the bit data items is performed by using the specific coordinate which is applied deformation employed when it is confirmed that the reliability of the at least one bit data item is higher than the predetermined value.

9. (new): A digital watermark information extracting method as claimed in claim 6, wherein in the case that each of bit data items constituting the digital watermark information is embedded in the image data by applying an alteration on at least one pixel data located at a predetermined position on a specific coordinate, said embedding position check step is executed for at least one bit data item among

the bit data items, and extraction of the bit data items is performed on the image data on which geometrical deformation is applied, the geometrical deformation being in accordance with deformation employed when it is confirmed that the reliability of the at least one bit data item is higher than the predetermined value, by using the specific coordinate which is no applied deformation by said embedding position check step.

10.   (new): A digital watermark information extracting method as claimed in claim 6, wherein said reference value is a data value of pixel data located near the pixel data thus extracted, or a data value of the pixel data thus extracted which is estimated by an interpolation using at least two pixel data items located near the pixel data thus extracted.

11.   (new): A bit value judgment method of digital watermark information in which each of bit data items constituting the digital watermark information is embedded in image data by applying an alteration on at least one pixel data located at a predetermined position on a specific coordinate, said method executing as to each of at least two bit data items among the bit data items constituting the digital watermark information;

a bit value judgment step for obtaining difference between a data value of pixel data in which the bit data item concerned is to be embedded and a reference value, and judging a bit value of the bit data item concerned from the difference;

a reliability calculation step for calculating reliability of the bit value thus judged from the difference; and

a reliability output step for outputting the bit value of the pixel data thus judged and the reliability of the bit value thus calculated.

12.   (new): A bit value judgment method as claimed in claim 11, wherein said reliability calculation step calculates the reliability of the bit value of the bit data item, on the basis of a probability distribution curve which is defined by distribution of difference between the data value of the pixel data in which the bit data item concerned is to be embedded and the reference value.